

Appl. No. 10/085,725
Reply to Office action of 01/20/2004

REMARKS

Reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-6 are pending in this case. Claims 1 and 6 are amended herein and claim 7 is cancelled herein.

The Examiner required restriction between the invention of group I (Claims 1-6) and the invention of group II (claim 7). Applicant hereby affirms the provisional election of group I. Claim 7 is cancelled.

The Examiner provisionally rejected claims 1, 2, 3, and 5 under the judicially created doctrine of obviousness-type double-patenting. The provisional rejection is acknowledged.

The Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. Specifically, the Examiner argued that claim 4 recited "the step of performing a fifth cleaning process . . ." and that this was not taught in the specification. However, claim 4 of the instant application does not recite a fifth cleaning process. Claim 4 recites "said first cleaning solution contains ammonia in an in-solution concentration in the range 1 ppm to 10 ppm." Applicant believes the Examiner may have mistakenly been referring to claim 4 of Application Serial no. 10/085753. Accordingly, Applicant respectfully requests that the objection be withdrawn.

The Examiner objected to claim 6 under 37 CFR 1.75(c) as being of proper dependent form. The Examiner argues that claim 6 depends from claim 1 and recites that the first cleaning solution contains hydrochloric acid, whereas claim 1 recites that the first cleaning solution consists of ultra-pure water containing a prescribed quantity of

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ozone. Again, Applicant believes that the Examiner is looking at the claims of Application Serial no. 10/085753. Instant claim 6 does not recite anything about the first cleaning solution and instant claim 1 does not recite ozone or involve the phrase "consists of". Accordingly, Applicant respectfully requests that the objection be withdrawn.

The Examiner rejected claims 1, 2, 3, 5 and 6 under 35 U.S.C. 102(a) or 102(e) as being anticipated by Matsuno et al. (U.S. 2001/0009155).

Applicant respectfully submits that amended claim 1 is unanticipated by Matsuno et al as there is no disclosure or suggestion in the Matsuno of a batch cleaning method comprising the step of performing a first cleaning process in which the semiconductor wafers are cleaned for a prescribed time by immersing them in a first cleaning solution comprising ultra-pure water containing a prescribed gas in a range 20% to 50% of the saturated concentration in a first cleaning tank. Instead, Matsuno teaches a single wafer process for cleaning a wafer. Because Matsuno teaches a single wafer process as opposed to the claimed batch cleaning, claim 1 and the claims dependent thereon are unanticipated by Matsuno.

Matsuno teaches a hydrogen water process to which ultrasonic waves may be applied. Matsuno teaches the hydrogen concentration may "preferably be 0.5 ppm or higher, with 1.0 to 1.6 ppm being particularly preferred." As noted in the Background of the instant application, hydrogen water cleaning with ultrasonic vibration with an in solution concentration of at least 1.0 ppm had been previously proposed. Results were obtained by spraying hydrogen water onto a revolving silicon wafer, as in Matsuno. However, as further noted in the Background, sufficient particle removal is not obtained when batch-type cleaning is used instead. Given the difference in results between single wafer and batch cleaning, it would not be obvious to modify Matsuno to a batch cleaning process. More specifically, a batch cleaning method using ultra-pure water containing a prescribed gas in a range 20% to 50% of the saturated concentration

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would not apparent to those of ordinary skill in the art having reference to Matsuno. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

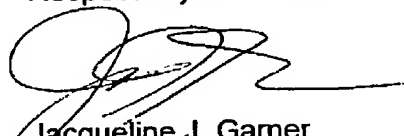
The Examiner rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Matsuno et al. (U.S. 2001/0009155) in view of Yeol et al. (U.S. 6,039,815).

Applicant respectfully submits that claim 4 is patentable over the references for the same reasons discussed above relative to claim 1 from which claim 4 depends. Yeol is added to teach cleaning using hydrogen water and an alkaline solution.

The other reference cited by the Examiner has been reviewed, but is not felt to come within the scope of the claims as amended.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-6. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



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